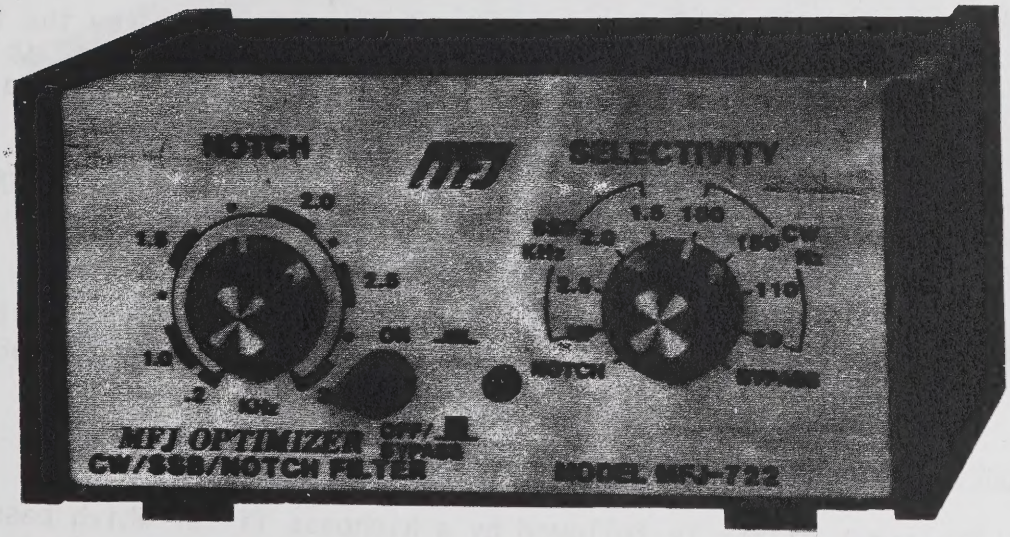
MFJ OPTIMIZER

CW/SSB/NOTCH FILTER

MODEL MFJ-722



OWNER'S MANUAL

CAUTION: Read All Instructions Before Operating Equipment.

MFJ ENTERPRISES, INC.

P. O. BOX 494, MISSISSIPPI STATE, MS. 39762, USA

MFJ 1200-0055-722

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MFJ-722 INSTRUCTIONS

INTRODUCTION

The MFJ-722 OPTIMIZER consists of a tunable notch filter combined with a switch selectable highpass/lowpass filter (SSB) and bandpass (CW) filter. This filtering capability allows you to remove interference from both SSB and CW signals thereby optimizing the desired signal.

INSTALLATION

1. Connect any 9-18 VDC, 300 ma power supply to the POWER jack on the rear of the MFJ-722. An optional AC adapter is available from MFJ Enterprises, Inc. Use a 2.5 mm subminiature plug with the tip positive. An 12 VDC, 300 ma power supply is required for maximum audio power output.
2. Connect a 4 to 16 ohm speaker to the SPEAKER jack or connect a set of mono or stereo headphones to the PHONE jack on the rear of the MFJ-722.
3. Connect a shielded lead, with the proper connector, from the external speaker or headphone jack of your receiver or transceiver to the INPUT jack on the rear of MFJ-722. The INPUT jack accepts an RCA phono plug.

CONTROLS

ON-OFF/BYPASS SWITCH:
When depressed power is applied to the circuit as indicated by the front panel LED. When out power is removed from the circuit and the input signal is switched directly to the SPEAKER and PHONE jacks. The filter circuit is bypassed.

NOTCH:
Varies the frequency of the notch filter section from 300 Hz to 3000 Hz.

SELECTIVITY:

NOTCH- Only the notch filter in the MFJ-722 affects the signal in this switch position. NOTE: The notch filter is operable in all other SELECTIVITY switch positions except BYPASS.

SSB MODE:

HP- The notch filter is followed by a highpass filter which passes all frequencies above 375 Hz. Frequencies below 375 Hz are rejected at the rate of 12 db/octave. This position greatly reduces 60 Hz and 120 Hz and hum and other frequency noise and interference.

2.5- The HP filter is followed by a lowpass filter that rejects frequencies above 2.5 KHz.

2.0- The 2.5 KHz filter is followed by another lowpass filter to give a cutoff frequency of 2.0 KHz.

1.5- The 2.0 KHz filter is followed by another lowpass filter to give a cutoff frequency of 1.5 KHz.

CW MODE:
The center frequency of the CW filters is approximately 750 Hz. The signal level peaks when you tune the signal to this tone. Low Q stages are used f minimum ringing.

180- A single stage, 2 pole active bandpass filter is selected with a 3 db banc

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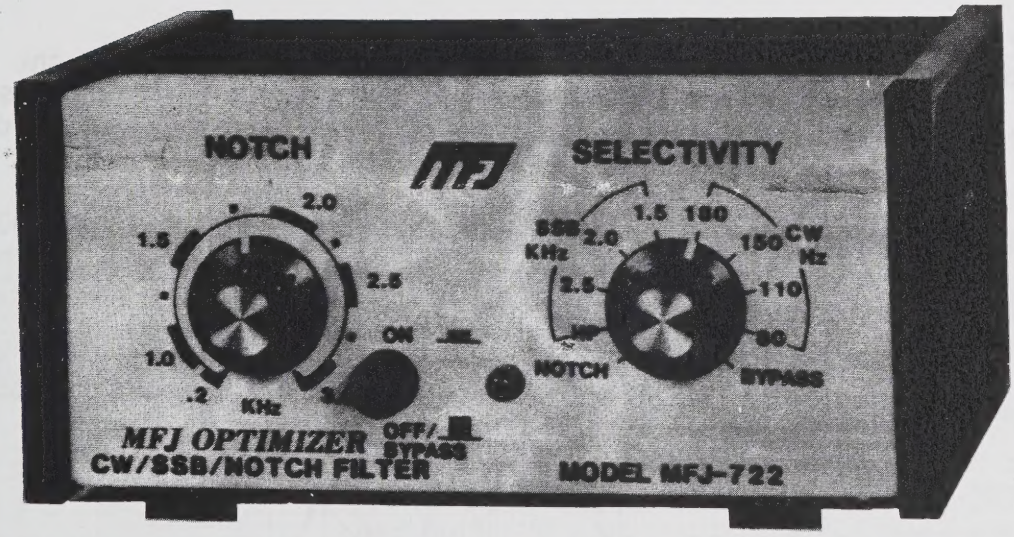

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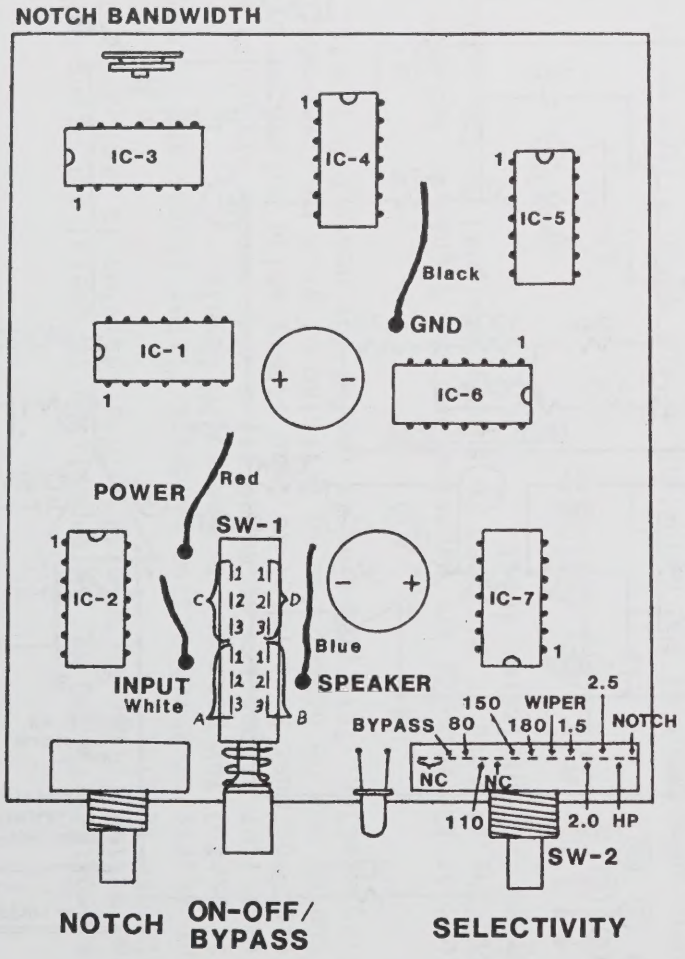
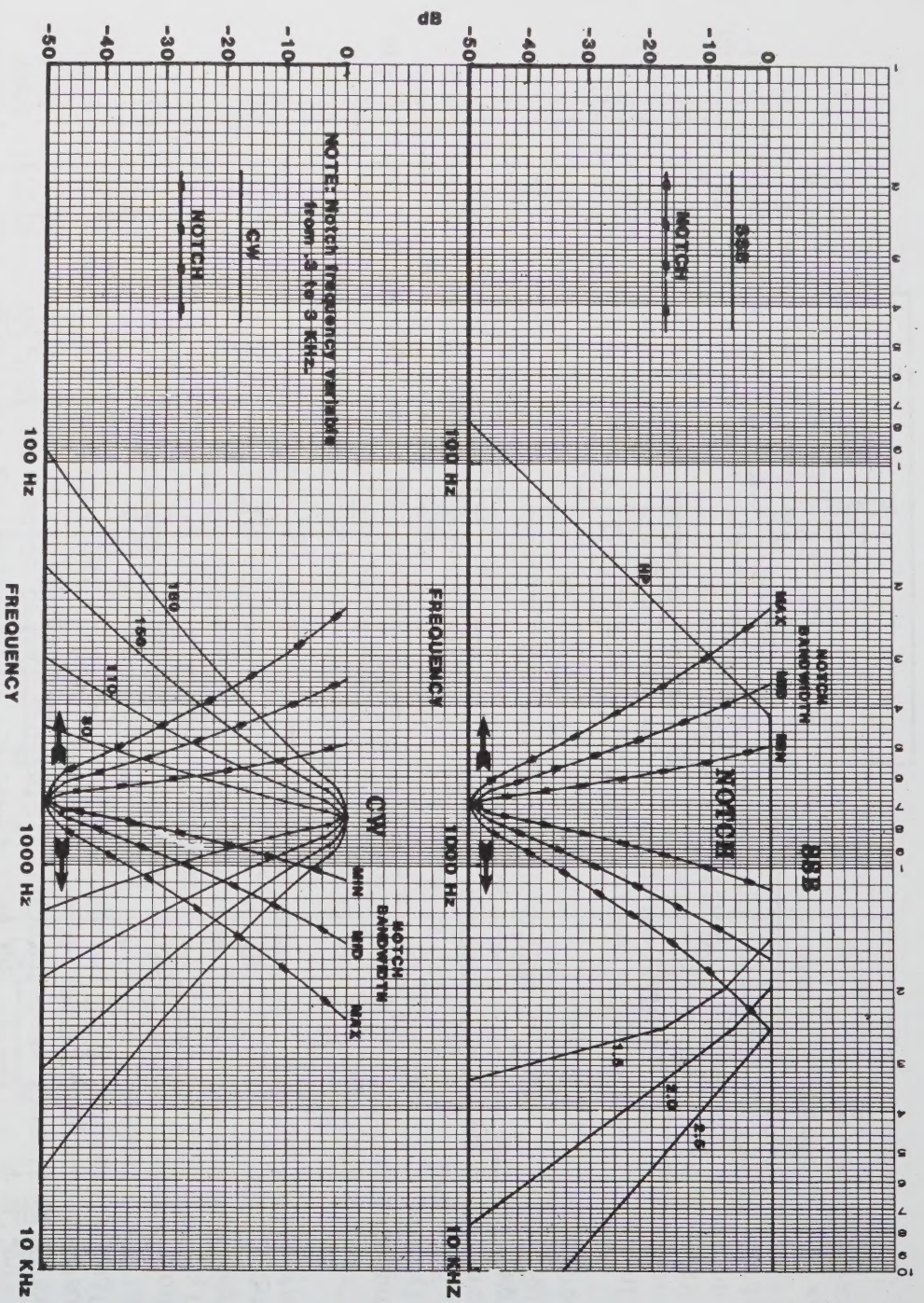
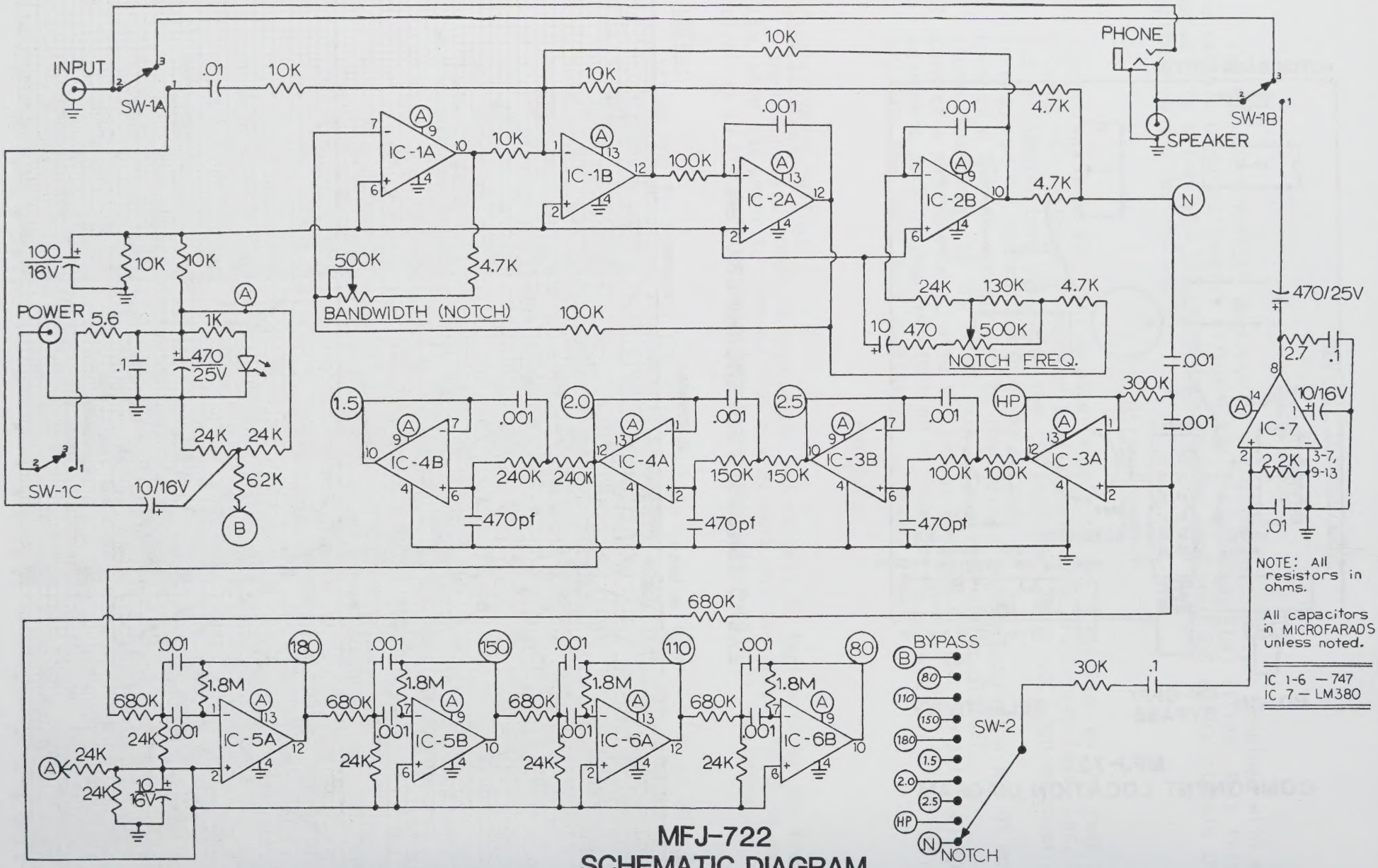


MFJ-722
COMPONENT LOCATION DIAGRAM

MFJ-722 FREQUENCY RESPONSE CURVE





NOTE: All resistors in ohms.

All capacitors in MICROFARADS unless noted.

IC 1-6 — 747
IC 7 — LM380

MFJ-722
SCHEMATIC DIAGRAM

width of approximately 180 Hz. This position is useful for light QRM levels.

150- A two-stage active filter is selected. This position is useful for light to moderate QRM levels.

110- The steeper skirts of three active bandpass filter stages are selected. This position is useful for moderate to heavy QRM levels.

80- Four active filter stages are selected for a very narrow bandwidth and very steep skirts. You must be careful to tune slowly while switch to this position. Slight retuning may be needed due to drifting of your receiver and/or the transmitting station. This position is useful for heavy QRM levels.

BYPASS:

All filter sections of the MFJ-722 are bypassed and the signal is fed directly to the amplifier circuit. The circuit is designed to supply a signal to the output which is virtually the same as the unfiltered input.

REAR PANEL CONTROLS

NOTCH BANDWIDTH:

This control allows adjustment of the bandwidth of the notch filter section only. This control is recessed and a screwdriver is necessary for adjustment. As the control is turned clockwise, as viewed from the rear, bandwidth decreases. Narrow bandwidth tuning easy but removes a larger slice of signal.

GENERAL OPERATIONS

After connection as decribed in the INSTALLATION section, the MFJ-722 is ready for use. The notch filter in the MFJ-722 is useful for removing interfering signals near the desired signal such as heterodynes, stations tuning up on your QSO, or CW signals near frequency. Care should be taken that the NOTCH BANDWIDTH control is not set too high or too low. If set too low, the bandwidth is so large the notch filter appears inoperable. If set too high, the bandwidth is so narrow that the NOTCH tuning is very critical and the notch frequency is hard to locate. The BANDWIDTH control is factory set to approximately mid-position. This is recommended until you become familiar with its effect. To use the notch filter only, set the SELECTIVITY switch to the NOTCH position. After tuning in the desired signal on your receiver, adjust the NOTCH control to attenuate unwanted signals near the tuned signal.

The SSB positions of the SELECTIVITY switch optimizes the desired signal by attenuating unwanted high or low frequencies. In the HP position, frequencies below approximately 375 Hz are attenuated reducing interference such as 60 Hz and 120 Hz hum. In the 2.5, 2.0, and 1.5 position, a lowpass filter is activated in addition to the highpass filter. The range of frequencies passed to the speaker or headphones is progressively narrower as the switch is changed from 2.5 to 2.0 to 1.5. Only those frequencies above the HP cutoff frequency of 375 Hz and below the selected lowpass cutoff frequency are passed.

In the CW SELECTIVITY switch positions, bandpass filters of switchable bandwidth are activated. The 3 db bandwidth is as set by the SELECTIVITY switch at either 180 Hz, 150 Hz, 110 Hz, or 80 Hz. At the 80 Hz position the selectivity is so great that you may notice a "talking in a barrel" or slight ringing effect. This is normal for this position. NOTE: 1) Be aware that the notch filter is operable at all SELECTIVITY switch settings except BYPASS. If you do not desire the notch function while using the SSB or CW switch positions, rotate the NOTCH control fully clockwise to minimize the notch filter effect.

FULL 12 MONTHS WARRANTY

MFJ Enterprises, Inc. warrants to the original owner of this product, if manufactured by MFJ Enterprises, Inc. and purchased from an authorized dealer or directly from MFJ Enterprises, Inc. to be free of defects in material and workmanship for a period of 12 months from date of purchase provided the following terms of this warranty are satisfied.

1. The purchaser must retain the dated proof-of-purchase (bill of sale, cancelled check, credit card or money order receipt, etc.) describing the product to establish the validity of warranty claim and must submit the original or a machine-reproduction of such proof-of-purchase to MFJ Enterprises, Inc. at the time of warranty service. MFJ Enterprises, Inc. shall have the discretion to deny warranty without dated proof-of-purchase. Any evidence of alteration, erasure, or forgery of proof-of-purchase shall be cause to void any and all warranty terms immediately.
2. MFJ Enterprises, Inc. agrees to repair or replace at MFJ's option without charge to the original owner any defective product provided the product is returned postage prepaid to MFJ Enterprises, Inc. with a personal check, cashier's check or money order for **$4.00** covering postage and handling.
3. MFJ Enterprises, Inc. will supply replacement parts free of charge for any MFJ product under warranty upon request. A dated proof-of-purchase and a **$4.00** personal check, cashier's check or money order must be provided to cover postage and handling.
4. This warranty is **NOT** void for owners who attempt to repair defective units. Technical consultation is available by calling (601) 323-5869.
5. This warranty does not apply to kits sold or manufactured by MFJ Enterprises, Inc.
6. Wired and tested PC board products are covered by this warranty provided **only the wired and tested PC board is returned.** Wired and tested PC boards installed in the owner's cabinet or connected to switches, jacks, cables, etc. sent to MFJ Enterprises, Inc. will be returned at the owner's expense unrepaired.
7. Under no circumstances is MFJ Enterprises, Inc. liable for consequential damages to person or property by the use of any MFJ product.
8. **Out-of-Warranty Service:** MFJ Enterprises, Inc. will repair any out-of-warranty product provided the unit is delivered prepaid. All charges will be shipped COD to the owner.
9. This warranty is given in lieu of any other warranty express or implied.
10. MFJ Enterprises, Inc. reserves the right to make changes or improvement in design or manufacture without incurring any obligation to install such changes upon any of the products previously manufactured.
11. All MFJ products to be serviced in-warranty or out-of-warranty should be addressed to **MFJ Enterprises, Inc., 921A Louisville Road, Starkville, Mississippi 39759, USA** and must be accompanied by a letter describing the problem in detail along with a copy of your dated proof-of-purchase.
12. This warranty gives you specific rights, and you may also have other rights which vary from state to state.